1. “More than half of California’s doctors say they are so frustrated with managed care they will quit, retire early, or leave the state within three years.” This statement is the lead sentence in an article titled “Doctors Feeling Pessimistic, Study Finds” (San Luis Obispo Tribune, July 15, 2001). This conclusion was based on a mail survey conducted by the California Medical Association. Surveys were mailed to 19,000 California doctors, and 2000 completed surveys were returned. Describe any concerns you have regarding the conclusion drawn in the first sentence of the article.

Non-Response Bias…only 2000/19,000 replied

2. Based on a survey of 4113 U.S. adults; researchers at Stanford University concluded that Internet use leads to increased social isolation. The survey was conducted by an Internet-based polling company that selected its samples from a pool of 35,000 potential respondents, all of whom had been given free Internet access and Web TV hardware in exchange for agreeing to regularly participate in surveys conducted by the polling company. Two criticisms of this study were expressed in an article that appeared in the San Luis Obispo Tribune (Feb. 28, 2000). The first criticism was that increased social isolation was measured by asking respondents if they were talking less to family and friends on the phone. The second criticism was that the sample was selected only from a group that was induced to participate by the offer of free Internet service, yet the results were generalized to all U.S. adults. Each of these criticisms is describing a type of bias. For each one, indicate what type of bias is being described and why it might make you question the conclusion drawn by the researchers.

Response Bias…I question how they are measuring social isolation. This doesn’t indicate lack of real friends.

Voluntary Sampling…always leads to selection bias.

3. Studies linking abnormal genes to an increased risk of breast cancer are now being reevaluated. The article “Gene's Role in Cancer May Be Overstated” (San Luis Obispo Tribune, Aug. 21, 2002) states that “early studies that evaluated breast cancer risk among gene mutation carriers selected women in families where sisters, mothers, and grandmothers all had breast cancer. This created a statistical bias that skewed risk estimates for women in the general population.” What type of bias is being described?

Selection Bias

4. According to the article “Effect of Preparation Methods on Total Fat Content, Moisture Content, and Sensory Characteristics of Breaded Chicken Nuggets and Beef Steak Fingers”, sensory tests were conducted using 40 college student volunteers at Texas Women's University. Give three reasons, apart from the relatively small sample size, why this sample may not be ideal as the basis for generalizing to the population of all college students.

Selection Bias…due to Voluntary Sampling…issue with only women…being in Texas only...
5. According to an article on the CNN.com web site titled "Majority of U.S. Teens Are Not Sexually Active, Study Shows," 52% of surveyed teenagers had never had sexual intercourse. A very large random sample of 16,262 high school students was the source of this information. If the population of interest consists of all teenagers in the United States, are there individuals in the population who had no chance of being included in the sample? What is the name for this type of bias?

   Selection Bias...does not include middle school students or early college.

6. A new and somewhat controversial polling procedure that replaces the phone with the Internet is being used to conduct public opinion polls. The article "Pollsters Fear Internet Numbers Offer Warped View" states that "many pollsters say Internet users as a whole are still too upper-income, highly educated, white, and urban to produce results that accurately reflect all Americans. What's more, while 94% of U.S. households had a telephone in 1998, only 26% had Internet access, according to a U.S. Department of Commerce study". What type of bias is being described in this statement? Do you think that this bias is a serious problem? Explain.

   Selection...only upper class would have internet at that time.

7. The article "Study Provides New Data on the Extent of Gambling by College Athletes" reported that "72% of college football and basketball players had bet money at least once since entering college." This conclusion was based on a study in which "copies of the survey were mailed to 3,000 athletes at 182 Division I institutions, 25% of whom responded." What types of bias might have influenced the results of this study? Explain.

   Response Bias...asked about gambling and people are always betting on stupid things.
   Selection Bias...only DI...only football & basketball...what about women

8. Examine each of the following questions for possible bias. If you think the question is biased, indicate how and propose a better question.

   a. Should companies that pollute the environment be compelled to pay the costs of cleanup?
      Response Bias...Should companies have to pay for pollution cleanup?

   b. Given that 18-year-olds are old enough to vote and to serve in the military, is it fair to set the drinking age at 21?
      Response Bias...Should the drinking age be 21?

   c. Do you think high school student should be required to wear uniforms?
      Good

   d. Given humanity's great tradition of exploration, do you favor continued funding for space flights?
      Response Bias...Should we continue to fund space flights?